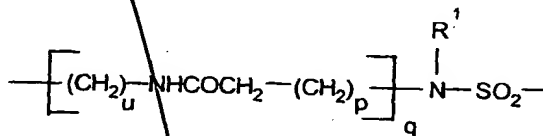


Sub D' Cont in which R<sup>F</sup> represents a straight-chain or branched perfluoroalkyl radical with 4 to 30 carbon atoms, and A is a molecule portion that contains 1-6 metal complexes.

SUB C2 5. A formulation according to claim 4, wherein molecule portion A stands for a group L-M, whereby L stands for a linker and M stands for a metal complex that consists of an open-chain or cyclic chelating agent, which as a central atom contains an atom of atomic numbers 21-29, 39, 42, 44 or 57-83.

6. A formulation according to claim 5, wherein linker L is a direct bond, a methylene group, an -NHCO group, a group

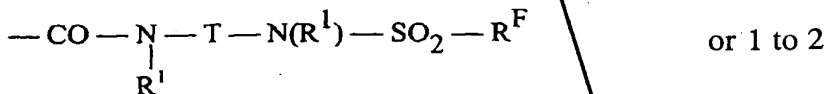


whereby p means the numbers 0 to 10, q and u,

independently of one another, mean the numbers 0 or 1, and

R<sup>1</sup> means a hydrogen atom, a methyl group, a -CH<sub>2</sub>-OH group, a -CH<sub>2</sub>-CO<sub>2</sub>H group or a C<sub>2</sub>-C<sub>15</sub> chain, which optionally is interrupted by 1 to 3 oxygen atoms, 1 to 2 >CO groups or an optionally substituted aryl group and/or is substituted with 1 to 4 hydroxyl groups, 1 to 2 C<sub>1</sub>-C<sub>4</sub> alkoxy groups, 1 to 2 carboxy groups,

Sub D' Cont or a straight-chain, branched, saturated or unsaturated C<sub>2</sub>-C<sub>30</sub> carbon chain, which optionally contains 1 to 10 oxygen atoms, 1 to 3 -NR<sup>1</sup> groups, 1 to 2 sulfur atoms, a piperazine, a -CONR<sup>1</sup> group, an -NR<sup>1</sup>CO group, an -SO<sub>2</sub> group, an -NR<sup>1</sup>-CO<sub>2</sub> group, 1 to 2 CO groups, a group



optionally substituted aryls and/or is interrupted by these groups and/or is optionally substituted with 1 to 3 -OR<sup>1</sup> groups, 1 to 2 oxo groups, 1 to 2 -NH-COR<sup>1</sup> groups, 1 to 2 -CONHR<sup>1</sup> groups, 1 to 2 -(CH<sub>2</sub>)<sub>p</sub>-CO<sub>2</sub>H groups, 1 to 2 groups -(CH<sub>2</sub>)<sub>p</sub>-(O)<sub>q</sub>-CH<sub>2</sub>CH<sub>2</sub>-R<sup>F</sup>,

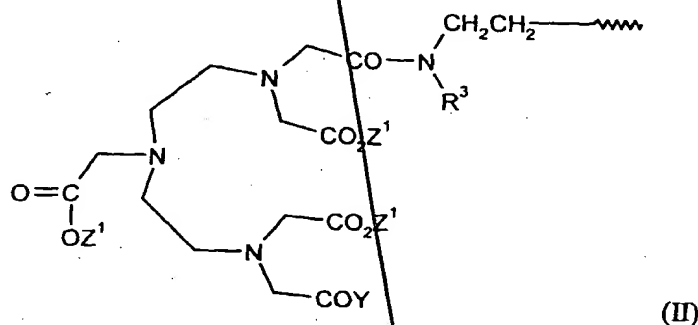
whereby

R<sup>1</sup>, and p and q have the above-indicated meanings,

and R<sup>F</sup> represents a straight-chain or branched perfluoroalkyl radical with 4 to 30 carbon atoms

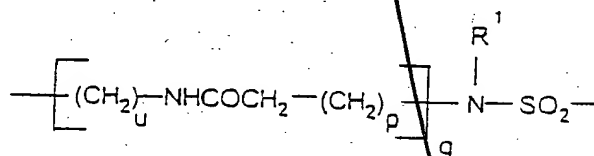
T means a C<sub>2</sub>-C<sub>10</sub> chain, which optionally is interrupted by 1 to 2 oxygen atoms or 1 to 2 -NHCO groups.

7. A formulation according to claim 5, wherein metal complex M stands for a complex of general formula II



in which R<sup>3</sup>, Z<sup>1</sup> and Y are independent of one another, and

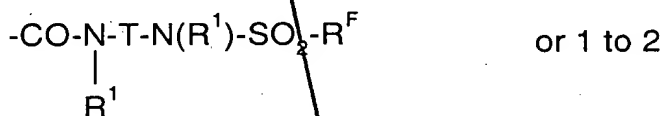
R<sup>3</sup> has the meaning of R<sup>1</sup> or -(CH<sub>2</sub>)<sub>m</sub>-L-R<sup>F</sup>, whereby m is 0, 1 or 2, and L is a direct bond, a methylene group, an -NHCO group, a group



whereby p means the numbers 0 to 10, q and u,

independently of one another, mean the numbers 0 or 1, and

$R^1$  means a hydrogen atom, a methyl group, a  $-CH_2-OH$  group, a  $-CH_2-CO_2H$  group or a  $C_2-C_{15}$  chain, which optionally is interrupted by 1 to 3 oxygen atoms, 1 to 2  $>CO$  groups or an optionally substituted aryl group and/or is substituted with 1 to 4 hydroxyl groups, 1 to 2  $C_1-C_4$  alkoxy groups, 1 to 2 carboxy groups, or a straight-chain, branched, saturated or unsaturated  $C_2-C_{30}$  carbon chain, which optionally contains 1 to 10 oxygen atoms, 1 to 3  $-NR^1$  groups, 1 to 2 sulfur atoms, a piperazine, a  $-CONR^1$  group, an  $-NR^1CO$  group, an  $-SO_2$  group, an  $-NR^1-CO_2$  group, 1 to 2  $CO$  groups, a group



optionally substituted aryls and/or is interrupted by these groups and/or is optionally substituted with 1 to 3  $-OR^1$  groups, 1 to 2 oxo groups, 1 to 2  $-NH-COR^1$  groups, 1 to 2  $-CONHR^1$  groups, 1 to 2  $(-CH_2)_p-CO_2H$  groups, 1 to 2 groups  $-(CH_2)_p-(O)_q-CH_2CH_2-R^F$ ,

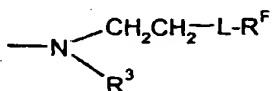
whereby

$R^1$ , and p and q have the above-indicated meanings,

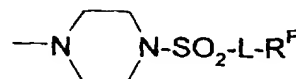
and  $R^F$  represents a straight-chain or branched perfluoroalkyl radical with 4 to 30 carbon atoms, and A is a molecule portion that contains 1-6 metal complexes,

$Z^1$ , independently of one another, mean a hydrogen atom or a metal ion equivalent of atomic numbers 21-29, 39, 42, 44 or 57-83,

Y means  $-OZ^1$  or

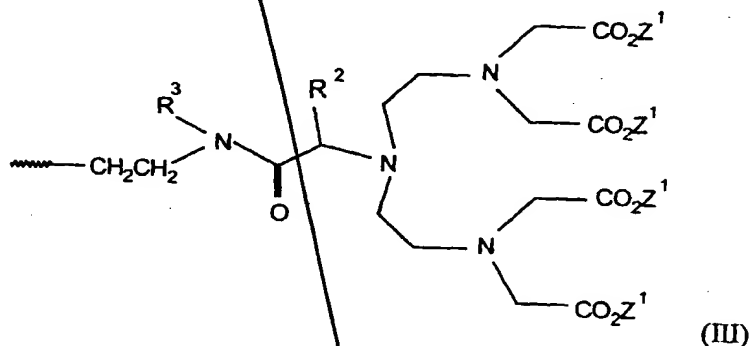


or



whereby  $Z^1$  and  $R^3$  have the above-mentioned meanings.

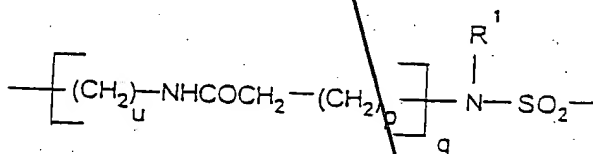
8. A formulation according to claim 5, wherein metal complex M stands for a complex of general formula III



in which

$R^3$  and  $Z^1$  are independent of one another, and

$R^3$  has the meaning of  $R^1$  or  $-(CH_2)_m-L-R^F$ , whereby  $m$  is 0, 1 or 2, and  $L$  is a direct bond, a methylene group, an  $-NHCO$  group, a group

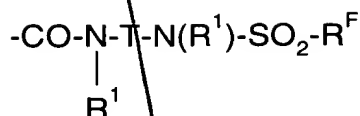


whereby  $p$  means the numbers 0 to 10,  $q$  and  $u$ ,

independently of one another, mean the numbers 0 or 1, and

$R^1$  means a hydrogen atom, a methyl group, a  $-CH_2-OH$  group, a  $-CH_2-CO_2H$  group or a  $C_2-C_{15}$  chain, which optionally is interrupted by 1 to 3 oxygen atoms, 1 to 2  $>CO$  groups or an optionally substituted aryl group and/or is substituted with 1 to 4 hydroxyl groups, 1 to 2  $C_1-C_4$  alkoxy groups, 1 to 2 carboxy groups,

or a straight-chain, branched, saturated or unsaturated  $C_2-C_{30}$  carbon chain, which optionally contains 1 to 10 oxygen atoms, 1 to 3  $-NR^1$  groups, 1 to 2 sulfur atoms, a piperazine, a  $-CONR^1$  group, an  $-NR^1CO$  group, an  $-SO_2$  group, an  $-NR^1-CO_2$  group, 1 to 2  $CO$  groups, a group



or 1 to 2

optionally substituted aryls and/or is interrupted by these groups and/or is optionally substituted with 1 to 3 -OR<sup>1</sup> groups, 1 to 2 oxo groups, 1 to 2 -NH-COR<sup>1</sup> groups, 1 to 2 -CONHR<sup>1</sup> groups, 1 to 2 (-CH<sub>2</sub>)<sub>p</sub>-CO<sub>2</sub>H groups, 1 to 2 groups -(CH<sub>2</sub>)<sub>p</sub>-(O)<sub>q</sub>-CH<sub>2</sub>CH<sub>2</sub>-R<sup>F</sup>,

whereby

R<sup>1</sup>, and p and q have the above-indicated meanings,

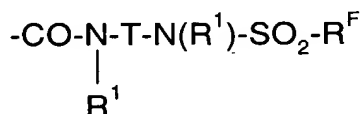
and R<sup>F</sup> represents a straight-chain or branched perfluoroalkyl radical with 4 to 30 carbon atoms, and A is a molecule portion that contains 1-6 metal complexes,

Z<sup>1</sup>, independently of one another, mean a hydrogen atom or a metal ion equivalent of atomic numbers 21-29, 39, 42, 44 or 57-83,

and R<sup>2</sup>

means a hydrogen atom, a methyl group, a -CH<sub>2</sub>-OH group, a -CH<sub>2</sub>-CO<sub>2</sub>H group or a C<sub>2</sub>-C<sub>15</sub> chain, which optionally is interrupted by 1 to 3 oxygen atoms, 1 to 2 >CO groups or an optionally substituted aryl group and/or is substituted with 1 to 4 hydroxyl groups, 1 to 2 C<sub>1</sub>-C<sub>4</sub> alkoxy groups, 1 to 2 carboxy groups,

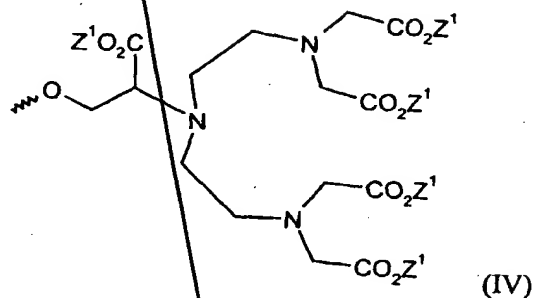
or a straight-chain, branched, saturated or unsaturated C<sub>2</sub>-C<sub>30</sub> carbon chain, which optionally contains 1 to 10 oxygen atoms, 1 to 3 -NR<sup>1</sup> groups, 1 to 2 sulfur atoms, a piperazine, a -CONR<sup>1</sup> group, an -NR<sup>1</sup>CO group, an -SO<sub>2</sub> group, an -NR<sup>1</sup>-CO<sub>2</sub> group, 1 to 2 CO groups, a group



or 1 to 2

optionally substituted aryls and/or is interrupted by these groups and/or is optionally substituted with 1 to 3 -OR<sup>1</sup> groups, 1 to 2 oxo groups, 1 to 2 -NH-COR<sup>1</sup> groups, 1 to 2 -CONHR<sup>1</sup> groups, 1 to 2 (-CH<sub>2</sub>)<sub>p</sub>-CO<sub>2</sub>H groups, 1 to 2 groups -(CH<sub>2</sub>)<sub>p</sub>-(O)<sub>q</sub>-CH<sub>2</sub>CH<sub>2</sub>-R<sup>F</sup>.

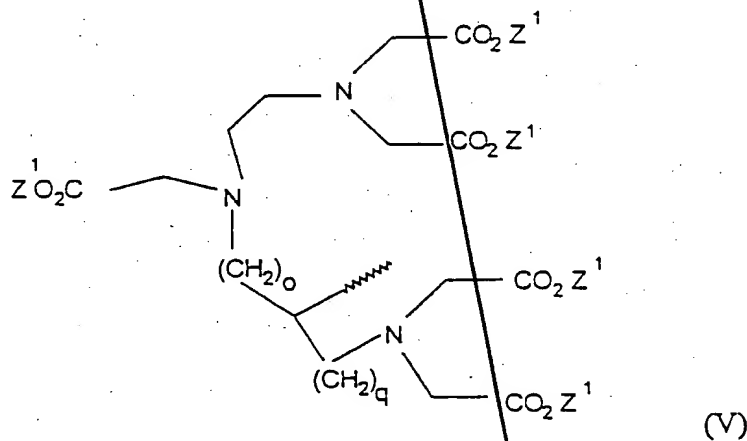
9. A formulation according to claim 5, wherein metal complex M stands for a metal complex of general formula IV



in which Z¹

independently of one another, mean a hydrogen atom or a metal ion equivalent of atomic numbers 21-29, 39, 42, 44 or 57-83.

10. A formulation according to claim 5, wherein metal complex M stands for a metal complex of general formula V

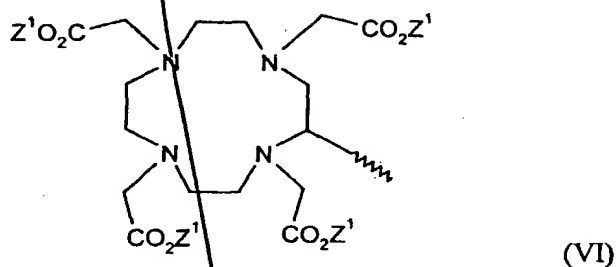


in which Z¹

independently of one another, mean a hydrogen atom or a metal ion equivalent of atomic numbers 21-29, 39, 42, 44 or 57-83,

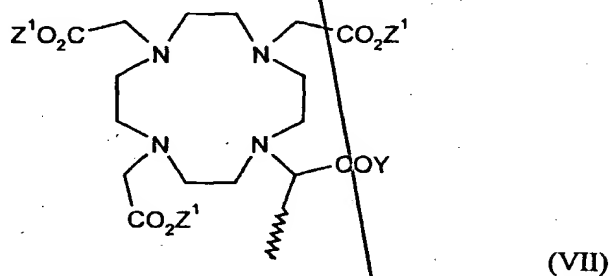
and o and q stand for numbers 0 or 1, and yields the sum  $o + q = 1$ .

11. A formulation according to claim 5, wherein metal complex M stands for a metal complex of general formula VI

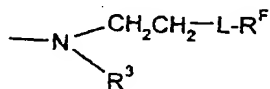


*Sub D Cont*  
 B) in which Z<sup>1</sup> independently of one another, mean a hydrogen atom or a metal ion equivalent of atomic numbers 21-29, 39, 42, 44 or 57-83.

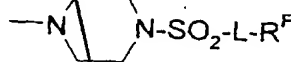
12. A formulation according to claim 5, wherein metal complex M stands for a metal complex of general formula VII



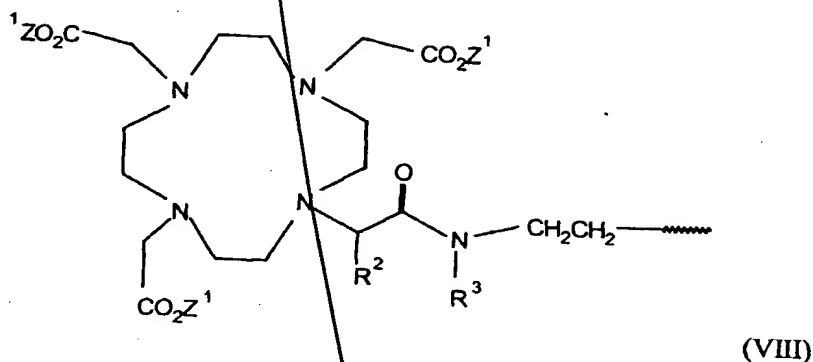
in which Z<sup>1</sup> independently of one another, mean a hydrogen atom or a metal ion equivalent of atomic numbers 21-29, 39, 42, 44 or 57-83,  
 and Y means -OZ<sup>1</sup> or



or



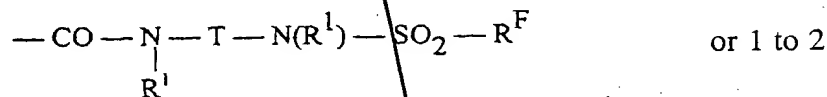
13. A formulation according to claim 5, wherein metal complex M is a complex of general formula VIII



in which

R<sup>3</sup>

has the meaning of R<sup>1</sup> or -(CH<sub>2</sub>)<sub>m</sub>-L-R<sup>F</sup>, whereby m is 0, 1 or 2, and L is a direct bond, a methylene group, an -NHCO group, a group

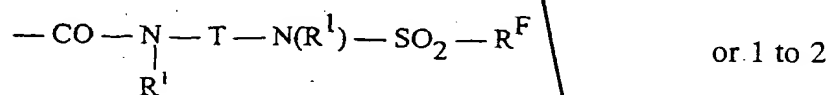


whereby p means the numbers 0 to 10, q and u,

independently of one another, mean the numbers 0 or 1, and

R<sup>1</sup> means a hydrogen atom, a methyl group, a -CH<sub>2</sub>-OH group, a -CH<sub>2</sub>-CO<sub>2</sub>H group or a C<sub>2</sub>-C<sub>15</sub> chain, which optionally is interrupted by 1 to 3 oxygen atoms, 1 to 2 >CO groups or an optionally substituted aryl group and/or is substituted with 1 to 4 hydroxyl groups, 1 to 2 C<sub>1</sub>-C<sub>4</sub> alkoxy groups, 1 to 2 carboxy groups,

or a straight-chain, branched, saturated or unsaturated C<sub>2</sub>-C<sub>30</sub> carbon chain, which optionally contains 1 to 10 oxygen atoms, 1 to 3 -NR<sup>1</sup> groups, 1 to 2 sulfur atoms, a piperazine, a -CONR<sup>1</sup> group, an -NR<sup>1</sup>CO group, an -SO<sub>2</sub> group, an -NR<sup>1</sup>-CO<sub>2</sub> group, 1 to 2 CO groups, a group



optionally substituted aryls and/or is interrupted by these groups and/or is optionally substituted with 1 to 3 -OR<sup>1</sup> groups, 1 to 2 oxo groups, 1 to 2 -NH-COR<sup>1</sup> groups, 1



to 2 -CONHR<sup>1</sup> groups, 1 to 2 (-CH<sub>2</sub>)<sub>p</sub>-CO<sub>2</sub>H groups, 1 to 2 groups -(CH<sub>2</sub>)<sub>p</sub>-(O)<sub>q</sub>-CH<sub>2</sub>CH<sub>2</sub>-R<sup>F</sup>,

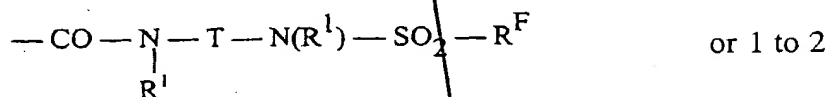
whereby

R<sup>1</sup>, and p and q have the above-indicated meanings,

and R<sup>F</sup> represents a straight-chain or branched perfluoroalkyl radical with 4 to 30 carbon atoms, and A is a molecule portion that contains 1-6 metal complexes, and Z<sup>1</sup>, independently of one another, mean a hydrogen atom or a metal ion equivalent of atomic numbers 21-29, 39, 42, 44 or 57-83,

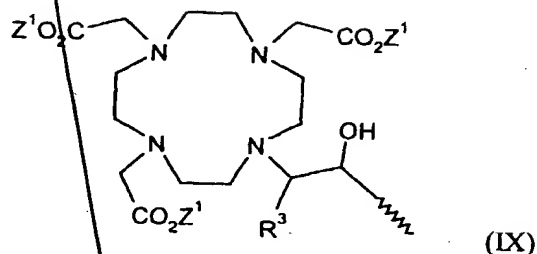
and R<sup>2</sup>

means a hydrogen atom, a methyl group, a -CH<sub>2</sub>-OH group, a -CH<sub>2</sub>-CO<sub>2</sub>H group or a C<sub>2</sub>-C<sub>15</sub> chain, which optionally is interrupted by 1 to 3 oxygen atoms, 1 to 2 >CO groups or an optionally substituted aryl group and/or is substituted with 1 to 4 hydroxyl groups, 1 to 2 C<sub>1</sub>-C<sub>4</sub> alkoxy groups, 1 to 2 carboxy groups, or a straight-chain, branched, saturated or unsaturated C<sub>2</sub>-C<sub>30</sub> carbon chain, which optionally contains 1 to 10 oxygen atoms, 1 to 3 -NR<sup>1</sup> groups, 1 to 2 sulfur atoms, a piperazine, a -CONR<sup>1</sup> group, an -NR<sup>1</sup>CO group, an -SO<sub>2</sub> group, an -NR<sup>1</sup>-CO<sub>2</sub> group, 1 to 2 CO groups, a group



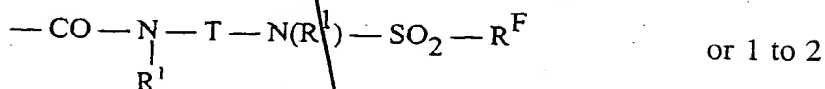
optionally substituted aryls and/or is interrupted by these groups and/or is optionally substituted with 1 to 3 -OR<sup>1</sup> groups, 1 to 2 oxo groups, 1 to 2 -NH-COR<sup>1</sup> groups, 1 to 2 -CONHR<sup>1</sup> groups, 1 to 2 (-CH<sub>2</sub>)<sub>p</sub>-CO<sub>2</sub>H groups, 1 to 2 groups -(CH<sub>2</sub>)<sub>p</sub>-(O)<sub>q</sub>-CH<sub>2</sub>CH<sub>2</sub>-R<sup>F</sup>.

14. A formulation according to claim 5, wherein metal complex M is a complex of general formula IX



in which  
R<sup>3</sup>

has the meaning of R<sup>1</sup> or -(CH<sub>2</sub>)<sub>m</sub>-L-R<sup>F</sup>, whereby m is 0, 1 or 2, and L is a direct bond, a methylene group, an -NHCO group, a group

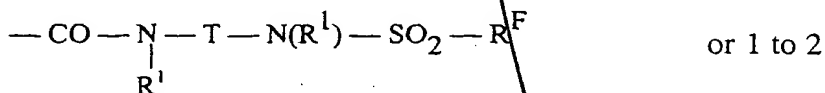


whereby p means the numbers 0 to 10, q and u,

independently of one another, mean the numbers 0 or 1, and

R<sup>1</sup> means a hydrogen atom, a methyl group, a -CH<sub>2</sub>-OH group, a -CH<sub>2</sub>-CO<sub>2</sub>H group or a C<sub>2</sub>-C<sub>13</sub> chain, which optionally is interrupted by 1 to 3 oxygen atoms, 1 to 2 >CO groups or an optionally substituted aryl group and/or is substituted with 1 to 4 hydroxyl groups, 1 to 2 C<sub>1</sub>-C<sub>4</sub> alkoxy groups, 1 to 2 carboxy groups,

or a straight-chain, branched, saturated or unsaturated C<sub>2</sub>-C<sub>30</sub> carbon chain, which optionally contains 1 to 10 oxygen atoms, 1 to 3 -NR<sup>1</sup> groups, 1 to 2 sulfur atoms, a piperazine, a -CONR<sup>1</sup> group, an -NR<sup>1</sup>CO group, an -SO<sub>2</sub> group, an -NR<sup>1</sup>-CO<sub>2</sub> group, 1 to 2 CO groups, a group



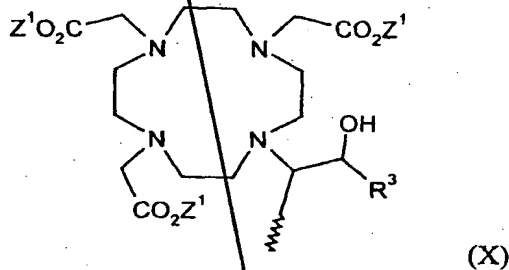
optionally substituted aryls and/or is interrupted by these groups and/or is optionally substituted with 1 to 3  $-OR^1$  groups, 1 to 2 oxo groups, 1 to 2  $-NH-COR^1$  groups, 1 to 2  $-CONHR^1$  groups, 1 to 2  $(-CH_2)_p-CO_2H$  groups, 1 to 2 groups  $-(CH_2)_p-(O)_q-CH_2CH_2-R^F$ ,

whereby

$R^1$ , and p and q have the above-indicated meanings,

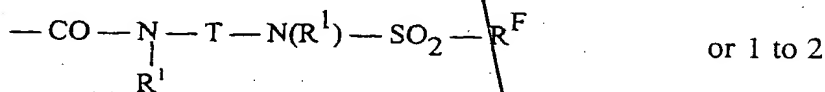
and  $R^F$  represents a straight-chain or branched perfluoroalkyl radical with 4 to 30 carbon atoms, and A is a molecule portion that contains 1-6 metal complexes, and  $Z^1$ , independently of one another, mean a hydrogen atom or a metal ion equivalent of atomic numbers 21-29, 39, 42, 44 or 57-83,

15. A formulation according to claim 5, wherein metal complex M is a complex of general formula X



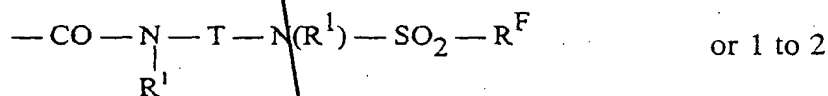
in which

$R^3$  has the meaning of  $R^1$  or  $-(CH_2)_m-L-R^F$ , whereby m is 0, 1 or 2, and L is a direct bond, a methylene group, an  $-NHCO$  group, a group



whereby p means the numbers 0 to 10, q and u, independently of one another, mean the numbers 0 or 1, and

$R^1$  means a hydrogen atom, a methyl group, a  $-CH_2-OH$  group, a  $-CH_2-CO_2H$  group or a  $C_2-C_{15}$  chain, which optionally is interrupted by 1 to 3 oxygen atoms, 1 to 2  $>CO$  groups or an optionally substituted aryl group and/or is substituted with 1 to 4 hydroxyl groups, 1 to 2  $C_1-C_4$  alkoxy groups, 1 to 2 carboxy groups, or a straight-chain, branched, saturated or unsaturated  $C_2-C_{30}$  carbon chain, which optionally contains 1 to 10 oxygen atoms, 1 to 3  $-NR^1$  groups, 1 to 2 sulfur atoms, a piperazine, a  $-CONR^1$  group, an  $-NR^1CO$  group, an  $-SO_2$  group, an  $-NR^1-CO_2$  group, 1 to 2  $CO$  groups, a group



optionally substituted aryls and/or is interrupted by these groups and/or is optionally substituted with 1 to 3  $-OR^1$  groups, 1 to 2 oxo groups, 1 to 2  $-NH-COR^1$  groups, 1 to 2  $-CONHR^1$  groups, 1 to 2  $(-CH_2)_p-CO_2H$  groups, 1 to 2 groups  $-(CH_2)_p-(O)_q-CH_2CH_2-R^F$ ,

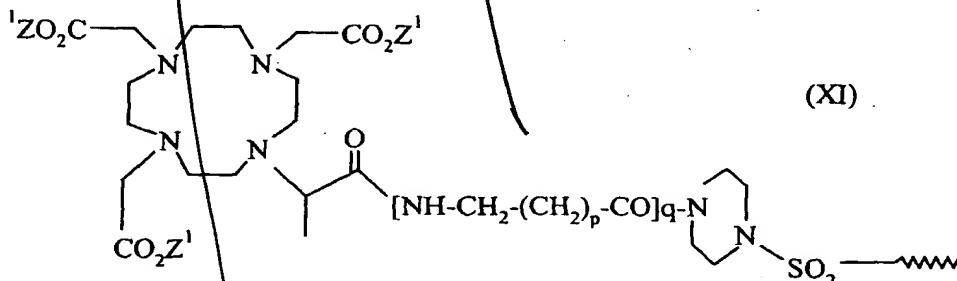
whereby

$R^1$ , and  $p$  and  $q$  have the above-indicated meanings,

and  $R^F$  represents a straight-chain or branched perfluoroalkyl radical with 4 to 30 carbon atoms, and  $A$  is a molecule portion that contains 1-6 metal complexes, and

$Z^1$ , independently of one another, mean a hydrogen atom or a metal ion equivalent of atomic numbers 21-29, 39, 42, 44 or 57-83.

16. A formulation according to claim 5, wherein metal complex  $M$  is a complex of general formula XI



in which

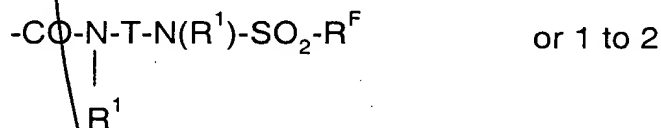
$Z^1$ , independently of one another, mean a hydrogen atom or a metal ion equivalent of atomic numbers 21-29, 39, 42, 44 or 57-83,

and whereby  $p$  means the numbers 0 to 10,  $q$  and  $u$ ,

independently of one another, mean the numbers 0 or 1, and

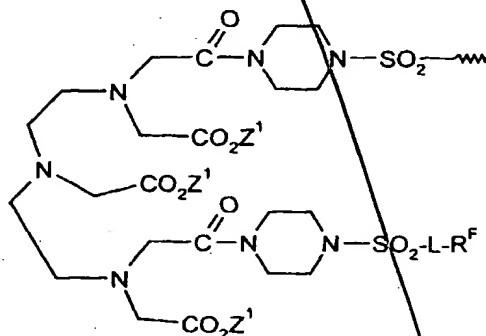
$R^2$  means a hydrogen atom, a methyl group, a  $-\text{CH}_2\text{-OH}$  group, a  $-\text{CH}_2\text{-CO}_2\text{H}$  group or a  $\text{C}_2\text{-C}_{15}$  chain, which optionally is interrupted by 1 to 3 oxygen atoms, 1 to 2  $>\text{CO}$  groups or an optionally substituted aryl group and/or is substituted with 1 to 4 hydroxyl groups, 1 to 2  $\text{C}_1\text{-C}_4$  alkoxy groups, 1 to 2 carboxy groups,

or a straight-chain, branched, saturated or unsaturated  $\text{C}_2\text{-C}_{30}$  carbon chain, which optionally contains 1 to 10 oxygen atoms, 1 to 3  $-\text{NR}^1$  groups, 1 to 2 sulfur atoms, a piperazine, a  $-\text{CONR}^1$  group, an  $-\text{NR}^1\text{CO}$  group, an  $-\text{SO}_2$  group, an  $-\text{NR}^1\text{-CO}_2$  group, 1 to 2  $\text{CO}$  groups, a group



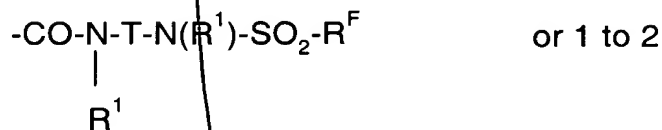
optionally substituted aryls and/or is interrupted by these groups and/or is optionally substituted with 1 to 3  $-\text{OR}^1$  groups, 1 to 2 oxo groups, 1 to 2  $-\text{NH-COR}^1$  groups, 1 to 2  $-\text{CONHR}^1$  groups, 1 to 2  $(-\text{CH}_2)_p\text{-CO}_2\text{H}$  groups, 1 to 2 groups  $-(\text{CH}_2)_p\text{-(O)}_q\text{-CH}_2\text{CH}_2\text{-R}^{\text{F}}$ .

17. A formulation according to claim 5, wherein metal complex M is a complex of general formula XII



(XII)

in which L is a direct bond, a methylene group, an -NHCO group, a group

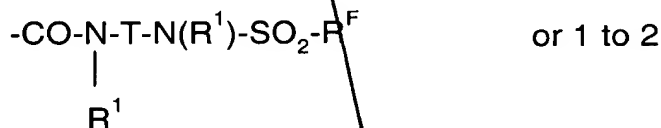


whereby p means the numbers 0 to 10, q and u,

independently of one another, mean the numbers 0 or 1, and

means a hydrogen atom, a methyl group, a -CH<sub>2</sub>-OH group, a -CH<sub>2</sub>-CO<sub>2</sub>H group or a C<sub>2</sub>-C<sub>15</sub> chain, which optionally is interrupted by 1 to 3 oxygen atoms, 1 to 2 >CO groups or an optionally substituted aryl group and/or is substituted with 1 to 4 hydroxyl groups, 1 to 2 C<sub>1</sub>-C<sub>4</sub> alkoxy groups, 1 to 2 carboxy groups,

or a straight-chain, branched, saturated or unsaturated C<sub>2</sub>-C<sub>30</sub> carbon chain, which optionally contains 1 to 10 oxygen atoms, 1 to 3 -NR<sup>1</sup> groups, 1 to 2 sulfur atoms, a piperazine, a -CONR<sup>1</sup> group, an -NR<sup>1</sup>CO group, an -SO<sub>2</sub> group, an -NR<sup>1</sup>-CO<sub>2</sub> group, 1 to 2 CO groups, a group



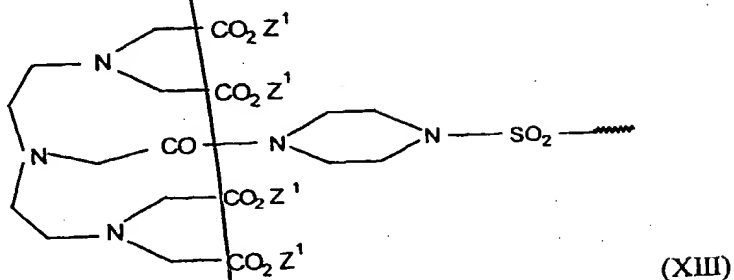
optionally substituted aryls and/or is interrupted by these groups and/or is optionally substituted with 1 to 3 -OR<sup>1</sup> groups, 1 to 2 oxo groups, 1 to 2 -NH-COR<sup>1</sup> groups, 1 to 2 -CONHR<sup>1</sup> groups, 1 to 2 (-CH<sub>2</sub>)<sub>p</sub>-CO<sub>2</sub>H groups, 1 to 2 groups -(CH<sub>2</sub>)<sub>p</sub>-(O)<sub>q</sub>-CH<sub>2</sub>CH<sub>2</sub>-R<sup>F</sup>,

whereby

R<sup>1</sup>, and p and q have the above-indicated meanings,

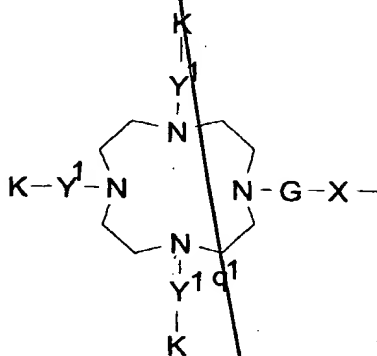
R<sup>F</sup> represents a straight-chain or branched perfluoroalkyl radical with 4 to 30 carbon atoms, and A is a molecule portion that contains 1-6 metal complexes, and Z<sup>1</sup>, independently of one another, mean a hydrogen atom or a metal ion equivalent of atomic numbers 21-29, 39, 42, 44 or 57-83.

18. A formulation according to claim 5, wherein metal complex M is a complex of general formula XIII



in which  $Z^1$ , independently of one another, mean a hydrogen atom or a metal ion equivalent of atomic numbers 21-29, 39, 42, 44 or 57-83.

19. A formulation according to claim 4, wherein molecule portion A has the following structure:

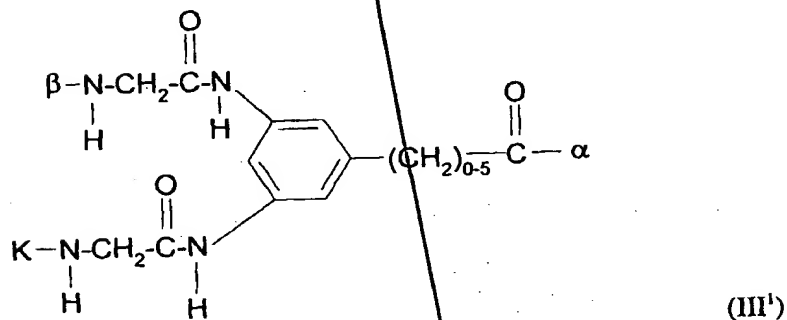
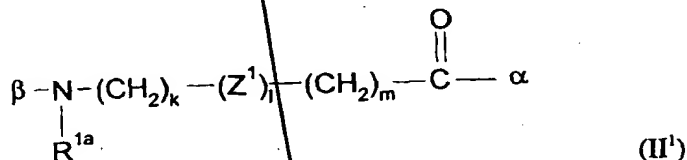


whereby

- $q^1$  is a number 0, 1, 2 or 3,
- K stands for a complexing agent or metal complex or salts thereof of organic and/or inorganic bases or amino acids or amino acid amides,
- X is a direct bond for the perfluoroalkyl group, a phenylene group or a  $C_1$ - $C_{10}$  alkyl chain, which optionally contains 1-15 oxygen atoms, 1-5 sulfur atoms, 1-10 carbonyl groups, 1-10 (NR) groups, 1-2  $NRSO_2$  groups, 1-10 CONR groups, 1 piperidine group, 1-3  $SO_2$  groups, 1-2 phenylene groups or optionally is substituted by 1-3 radicals  $R^F$ , in which R stands for a hydrogen atom, a phenyl, benzyl or a

C<sub>1</sub>-C<sub>15</sub> alkyl group, which optionally contains 1-2 NHCO groups, 1-2 CO groups, 1-5 oxygen atoms and optionally is substituted by 1-5 hydroxy, 1-5 methoxy, 1-3 carboxy, 1-3 R<sup>F</sup> radicals,

- Y is a direct bond or a chain of general formula II' or III':



in which

- R<sup>1a</sup> is a hydrogen atom, a phenyl group, a benzyl group or a C<sub>1</sub>-C<sub>7</sub> alkyl group, which optionally is substituted with a carboxy group, a methoxy group or a hydroxy group,
- Z<sup>1</sup> is a direct bond, a polyglycol ether group with up to 5 glycol units or a molecule portion of general formula IV<sup>1</sup>



in which R<sup>2a</sup> is a C<sub>1</sub>-C<sub>7</sub> carboxylic acid, a phenyl group, a benzyl group or a -(CH<sub>2</sub>)<sub>1-5</sub>-NH-K group,

- $\alpha$  represents the binding to the nitrogen atom of the skeleton chain,  $\beta$  represents the binding to the complexing agent or metal complex K,

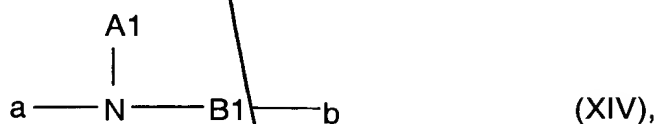


- and in which variables k and m stand for natural numbers between 0 and 10, and l stands for 0 or 1,

and whereby

- G is a CO or SO<sub>2</sub> group.

20. A formulation according to claim 5, in which linker L stands for a molecule portion according to general formula XIV



in which

N represents a nitrogen atom,

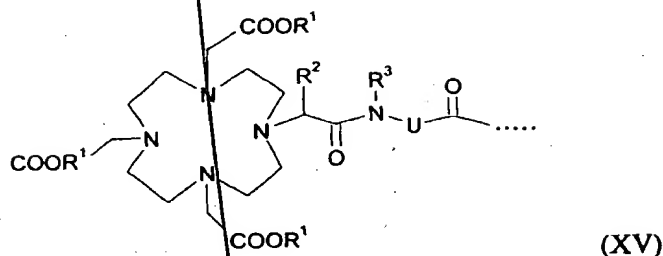
A1 means a hydrogen atom, a straight-chain or branched C<sub>1</sub>-C<sub>30</sub> alkyl group, which optionally is interrupted by 1-15 oxygen atoms and/or optionally is substituted with 1-10 hydroxy groups, 1-2 COOH groups, a phenyl group, a benzyl group and/or 1-5 -OR<sup>4</sup> groups, with R<sup>4</sup> in the meaning of a hydrogen atom or a C<sub>1</sub>-C<sub>7</sub> alkyl radical, or B1-R<sup>F</sup>,

B1 means a straight-chain or branched C<sub>1</sub>-C<sub>30</sub> alkylene group that optionally is interrupted by 1-10 oxygen atoms, 1-5 -NH-CO groups, 1-5 -CO-NH groups, by a phenylene group (that is optionally substituted by a COOH group), 1-3 sulfur atoms, 1-2 -N(B2)-SO<sub>2</sub> groups, and/or 1-2 -SO<sub>2</sub>-N(B2) groups with B2 in the meaning of A1, an NHCO group, a CONH group, an N(B2)-SO<sub>2</sub> group, or an -SO<sub>2</sub>-N(B2) group and/or optionally is substituted with radical R<sup>F</sup> a straight or branched perfluoroalkyl radical with 4 to 30 carbon atoms,

and in which a represents the binding to metal complex M, and b

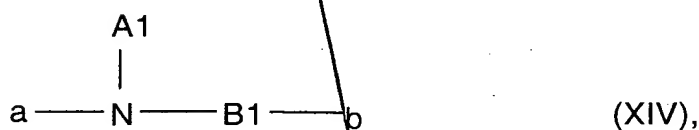
represents the binding to a straight or branched perfluoroalkyl radical with 4 to 30 carbon atoms.

21. A formulation according to claim 5, wherein metal complex M stands for a metal complex of general formula XV



whereby

- $R^1$  stands for a hydrogen atom or a metal ion equivalent of atomic numbers 21-29, 31, 32, 37-39, 42-44, 49 or 57-83,
- $R^2$  and  $R^3$  stand for a hydrogen atom, a  $C_1$ - $C_7$  alkyl group, a benzyl group, a phenyl group,  $-CH_2OH$  or  $-CH_2-OCH_3$ ,
- U stands for radical L, in which radical L stands for a molecule portion according to general formula XIV



in which

- N represents a nitrogen atom,
- A1 means a hydrogen atom, a straight-chain or branched  $C_1$ - $C_{30}$  alkyl group, which optionally is interrupted by 1-15 oxygen atoms and/or optionally is substituted with 1-10 hydroxy groups, 1-2 COOH groups, a phenyl group, a benzyl group and/or 1-5  $-OR^4$  groups; with  $R^4$  in the meaning of a hydrogen atom or a  $C_1$ - $C_7$  alkyl radical, or B1- $R^F$ ,
- B1 means a straight-chain or branched  $C_1$ - $C_{30}$  alkylene group that optionally is interrupted by 1-10 oxygen atoms, 1-5  $-NH-CO$  groups,

Sub D' Cont

1-5 -CO-NH groups, by a phenylene group (that is optionally substituted by a COOH group), 1-3 sulfur atoms, 1-2 -N(B2)-SO<sub>2</sub> groups, and/or 1-2 -SO<sub>2</sub>-N(B2) groups with B2 in the meaning of A1, an NHCO group, a CONH group, an N(B2)-SO<sub>2</sub> group, or an -SO<sub>2</sub>-N(B2) group and/or optionally is substituted with radical R<sup>F</sup> a straight or branched perfluoroalkyl radical with 4 to 30 carbon atoms, and in which a represents the binding to metal complex M, and b represents the binding to a straight or branched perfluoroalkyl radical with 4 to 30 carbon atoms.

whereby L and U, independently of one another, can be the same or different, however.

B

22. A formulation according to claim 1, wherein the central atom of the metal complex is a gadolinium atom (atomic number 64).

23. A formulation according to claim 1, wherein the diamagnetic, perfluoroalkyl-containing substances are those of general formula XVI:



in which R<sup>F</sup> represents a straight-chain or branched perfluoroalkyl radical with 4 to 30 carbon atoms, L stands for a linker, and B<sup>2</sup> stands for a hydrophilic group.

24. A formulation according to claim 23, wherein linker L<sup>1</sup> is a direct bond, an -SO<sub>2</sub> group or a straight-chain or branched carbon chain with up to 20 carbon atoms, which can be substituted with one or more -OH, -COO<sup>-</sup>, -SO<sub>3</sub> groups and/or optionally contains one or more -O-, -S-, -CO-, -CONH-, -NHCO-, -CONR-, -NRCO-, -SO<sub>2</sub>-, -PO<sub>4</sub>'-, -NH-, -NR groups, an aryl ring or a piperazine, whereby R stands for a C<sub>1</sub> to C<sub>20</sub> alkyl radical, which in turn can contain one or more O atoms and/or can be substituted with -COO<sup>-</sup> or SO<sub>3</sub> groups.

25. A formulation according to claim 23, wherein the hydrophilic group is a monosaccharide or a disaccharide, one or more adjacent -COO<sup>-</sup> or -SO<sub>3</sub> groups, a

dicarboxylic acid, an isophthalic acid, a picolinic acid, a benzenesulfonic acid, a tetrahydropyrandicarboxylic acid, a 2,6-pyridinecarboxylic acid, a quaternary ammonium ion, an aminopolycarboxylic acid, an aminodipolyethyleneglycosulfonic acid, an aminopolyethylene glycol group, an  $\text{SO}_2\text{-(CH}_2\text{)}_2\text{-OH}$  group, a polyhydroxyalkyl chain with at least two hydroxyl groups or one or more polyethylene glycol chains with at least two glycol units, whereby the polyethylene glycol chains are terminated by an  $\text{-OH}$  or  $\text{-OCH}_3$  group.

but D1 cont  
B1  
26. A formulation according to claim 1, wherein the diamagnetic perfluoroalkyl-containing substances are conjugates that consist of  $\alpha$ -,  $\beta$ -, or  $\gamma$ -cyclodextrin and compounds of general formula XVIII:



in which  $\text{A}^1$  stands for an adamantane, biphenyl or anthracene molecule,  $\text{L}^3$  stands for a linker and  $\text{R}^{\text{F}}$  stands for a straight-chain or branched perfluoroalkyl radical with 4 to 30 carbon atoms; and whereby linker  $\text{L}^3$  is a straight-chain hydrocarbon chain with 1 to 20 carbon atoms, which can be interrupted by one or more oxygen atoms, one or more  $\text{CO-}$ ,  $\text{SO}_2\text{-}$ ,  $\text{CONH-}$ ,  $\text{NHCO-}$ ,  $\text{CONR-}$ ,  $\text{NRCO-}$ ,  $\text{NH-}$ ,  $\text{NR}$  groups or a piperazine, whereby R is a  $\text{C}_1\text{-C}_5$  alkyl radical.

27. A formulation according to claim 1, wherein the perfluoroalkyl chains of the perfluoroalkyl-containing metal complex and the other perfluoroalkyl-containing compounds contain 6 to 12 carbon atoms.

28. A formulation according to claim 1, wherein the perfluoroalkyl chains contain 8 carbon atoms in each case.

29. A formulation according to claim 1, wherein it has a metal concentration of 50 to 250 mmol/l.

30. A substance of general formula XVII



in which  $R^F$  represents a straight-chain or branched perfluoroalkyl radical with 4 to 30 carbon atoms, and  $X^1$  is a radical that is selected from the group of the following radicals (in this case, n is a number between 1 and 10):

31. A conjugate that consist of  $\alpha$ -,  $\beta$ -, or  $\gamma$ -cyclodextrin and compounds of general formula XVIII



in which  $A^1$  stands for an adamantane, biphenyl or anthracene molecule,  $L^3$  stands for a linker and  $R^F$  stands for a straight-chain or branched perfluoroalkyl radical with 4 to 30 carbon atoms, and whereby linker  $L^3$  is a straight-chain hydrocarbon chain with 1 to 20 carbon atoms, which can be interrupted by one or more oxygen atoms, one or more  $CO$ -,  $SO_2$ -,  $CONH$ -,  $NHCO$ -,  $CONR$ -,  $NRCO$ -,  $NH$ -,  $NR$  groups or a piperazine, whereby R is a  $C_1$ - $C_5$  alkyl radical.

32. A process for the production of galenical formulations according to claim 1, wherein the paramagnetic and diamagnetic perfluoroalkyl-containing compounds are dissolved in a solvent while being stirred vigorously.

33. A process for the production of galenical formulations according to claim 1, wherein the paramagnetic and diamagnetic perfluoroalkyl-containing compounds are dissolved in a solvent while being treated simultaneously with ultrasound.

34. A process for the production of galenical formulations according to claim 1, wherein the paramagnetic and diamagnetic perfluoroalkyl-containing compounds are dissolved in a solvent while being treated simultaneously with microwaves.

35. A process for the production of galenical formulations according to claim 1, wherein the paramagnetic and diamagnetic perfluoroalkyl-containing compounds are dissolved in two different solvents, both solutions are added together, and one of the two solvents is distilled off.

36. A solid formulation according to claim 1, wherein it is produced by freeze-drying a solution, which contains paramagnetic and diamagnetic perfluoroalkyl-containing substances.

37. Contrast media for nuclear spin tomography comprising galenical formulations according to claim 1.

38. Contrast media for visualizing lymph nodes or a blood-pool comprising galenical formulations according to claim 1.